

Claims

1. A process for gelatinising starch and/or a starch derivative by
subjecting starch and/or a starch derivative in the presence of a carbohydrate
polymer or synthetic polymer to a thermo mechanical treatment, which
carbohydrate polymer or synthetic comprises aldehyde containing monomer
5 units, whereby at least 1 % of the aldehyde containing monomer units
comprise one or more aldehyde group per monomer unit which one or more
aldehyde groups are derived from one or more primary alcohol groups.
2. A process according to claim 1, wherein the one or more aldehyde
10 groups are derived from one or more primary alcohol groups at the C-6
position.
3. A process according to claim 1 or 2, wherein 1-50 % of the aldehyde
containing monomer units comprise one or more aldehyde groups per monomer
15 unit.
4. A process according to claim 3, wherein 1-20 % of the aldehyde
containing monomer units comprise one or more aldehyde groups per monomer
unit.
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5. A process according to any one of claims 1-4, wherein the aldehyde
containing monomer units in the carbohydrate polymer comprise in addition a
cleaved vicinal diol system.
- 25 6. A process according to any one of claims 1-5, wherein the carbohydrate
polymer comprises α -1,4-glucans (the "starch family"), β -1,4-glucans (cellulose),
glucomannans and galactomannans (guar and locust bean gum),

arabinoxylans and xylans (hemicellulose) and β -2,1 and β -2,6-fructans (inulin and levan)

7. A process according to claim 6, wherein the carbohydrate polymer
5 comprises starch, cellulose, fructans, hemi-cellulose, and/or galactomannans.

8. A process according to any one of claims 1-7, wherein the one aldehyde
group is introduced in the monomer unit by means of protected aldehydes
10 (acetals) or substituted unsaturated functionalities followed by oxidation of
through hindered nitroxyl mediated oxidation.

9. A process according to any one of claims 1-8, wherein the carbohydrate
polymer is present in an amount of from 1 to 100 weight %, based on the total
15 weight of the starch and/or starch derivative and the carbohydrate polymer or
synthetic polymer.

10. A process according to any one of claims 1-9, wherein the thermo
mechanical treatment is carried out at a temperature in the range of from 80-
20 130 °C.

11. A process according to any one of claims 1-10, wherein the thermo
mechanical treatment is carried out continuously.

25 12. A granulate of thermoplastic starch that comprises a carbohydrate
polymer or a synthetic polymer in an amount in the range of from 3 to 75
weight %, based on total thermoplastic starch, a polyol or urea as plasticizer and
water, which carbohydrate polymer or synthetic polymer comprises aldehyde
containing monomer units, whereby at least 1 % of the aldehyde containing

units comprise one or more aldehyde groups per monomer unit which one or more aldehyde groups are derived from one or more primary alcohol groups.

13. A shaped starch product that comprises thermoplastic starch and a
5 carbohydrate polymer or a synthetic polymer, wherein the carbohydrate polymer or synthetic polymer is present in an amount in the range of from 3 to 75 weight %, based on total thermoplastic starch, a polyol or urea as plasticizer and water, which carbohydrate polymer or synthetic polymer comprises aldehyde containing monomer units, whereby at least 1 % of the aldehyde
10 containing units comprise one or more aldehyde groups per monomer unit which one or more aldehyde groups are derived from one or more primary alcohol groups.

14. A blown starch film that comprises a thermoplastic starch and a
15 carbohydrate polymer or a synthetic polymer, wherein the carbohydrate polymer or synthetic polymer is present in an amount in the range of from 3 to 75 weight %, based on total thermoplastic starch, a polyol or urea as plasticizer and water, which carbohydrate polymer or synthetic polymer comprises aldehyde containing monomer units, whereby at least 1 % of the aldehyde
20 containing units comprise one or more aldehyde groups per monomer unit which one or more aldehyde groups are derived from one or more primary alcohol groups.

15. A starch or starch product according to any one of claims 12-14
25 comprising in addition a polyester.

16. A food product that comprises a food component and a carbohydrate polymer or a synthetic polymer, which carbohydrate polymer or synthetic polymer comprises aldehyde containing monomer units, whereby at least 1 %
30 of the aldehyde containing monomer units comprise one or more aldehyde

groups per monomer unit which one or more aldehyde groups are derived from one or more primary alcohol groups.